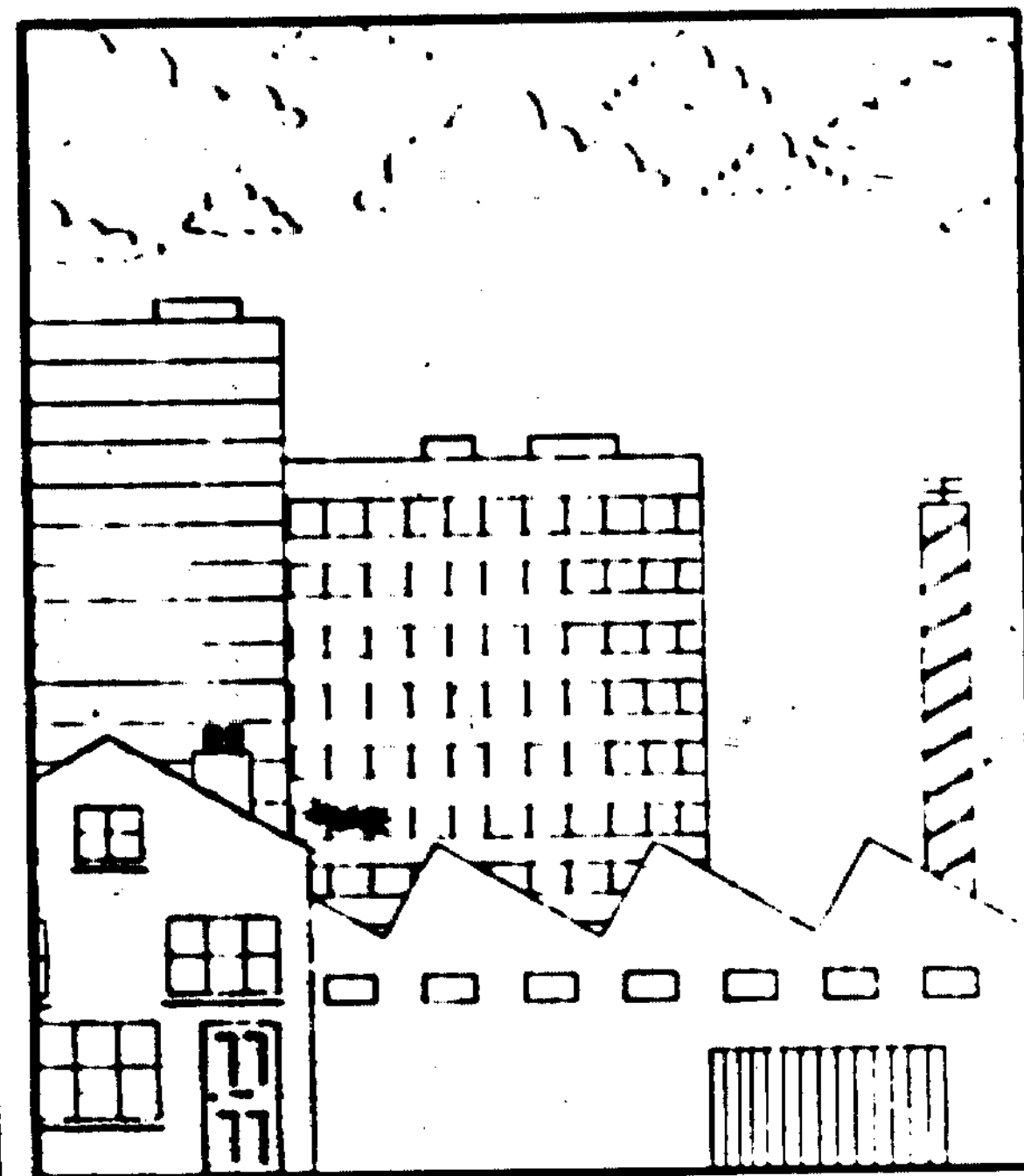


International Conference

INDOOR AND AMBIENT AIR QUALITY

13-15 June 1988



Imperial College
London

Programme and Invitation
to Register

FOREWORD

With problems of indoor air quality becoming increasingly apparent, it is essential to have a far more detailed and fundamental understanding of the occurrence of specific chemicals in indoor air, and of their mechanisms of interaction and modes of dispersion. Such factors are heavily influenced both by construction materials used in buildings and their design as well as building ventilation and maintenance.

The contribution made to air quality by passive smoking and environmental tobacco smoke is typically an area that needs careful scientific evaluation, as do such problems as sick building syndrome which has recently attracted considerable publicity. Here the importance of architectural and service design is widely acknowledged with many innovative changes needed for the future.

Accordingly the conference will centre on the scientific, engineering and health aspects of indoor air quality, whilst concentrating upon the following major themes:

- Indoor Air Chemistry
- Specific Chemicals: their Interaction and Dispersion
- Environmental Tobacco Smoke and Passive Smoking
- Airborne Bacteria
- Risk Assessment and Health Effects
- Indoor Air Quality Control
- Ventilation and Dispersion
- Architectural Design Concepts
- Transport Related Air Pollution
- Air Quality Impact Assessment
- Ambient Air Quality Monitoring

Both state-of-the-art reviews and original research papers will be presented as will specific case studies and field evaluations.

The conference has already attracted submitted papers from universities, research laboratories, regulatory agencies and administrators, as well as from private industry in many countries. The outcome will prove invaluable both to the experienced worker in the field wishing to discuss the most up-to-date research, as well as providing an excellent overview to the administrator or industrial scientist whose brief includes ambient air quality.

The Chairman and Technical Programme Committee are pleased to extend an invitation to you to participate in this major international conference and look forward to a very successful meeting in June.

R Perry

GENERAL INFORMATION

Venue

The Conference will be held at Imperial College, University of London, which is situated at South Kensington in central London. The London underground at South Kensington is within comfortable walking distance and provides direct easy access from Heathrow Airport and via British Rail from Gatwick Airport. A large number of hotels are within easy walking distance of the College.

Technical Programme

The Conference will commence at 13.30 on Monday 13th June. An initial session of plenary lectures will be followed by two parallel sessions throughout the conference. Details of invited and contributed papers given in the following programme.

Registration

Delegates should, as far as possible, make their registration in advance. A registration form is enclosed and this should be completed and returned to the Secretariat as soon as possible.

Registration will take place in the Department of Mechanical Engineering at Imperial College, situated on Exhibition Road, on Monday 13th June from 10.30 until 18.00 and commencing at 8.15 on each successive day. All delegates will be able to collect conference literature and proceedings from the registration desk prior to the Conference. At the registration desk you should present your confirmation of registration or, if you have not paid prior to the conference, you will be required to settle the amount in full, either in travellers cheques, personal cheques or cash.

Official Language

The official language of the Conference is English which will be used for all presentations and printed material.

Authors' Briefing Sessions

Authors should meet their session chairman in the lecture theatre where their paper is to be presented, 10 minutes before the commencement of the session. This period is for briefing by the session chairman and to organize arrangements for any slides, overheads to be used. 35 mm and overhead projectors will be available in both lecture theatres.

Lunches and Refreshments

A buffet lunch will be served on the 14th and 15th June, in addition to coffee and tea which will be served mid-morning and mid-afternoon. A Chairman's Wine and Cheese Reception will be held between 18.00 and 20.00 on Monday 13th June and the Conference Dinner will be held at the Sherfield Building, Imperial College, on the evening of 14th June. All lunches, refreshments and social events are included in the registration fee.

Accommodation and Travel

Although no specific hotel has been defined for the conference, early hotel and travel bookings are advised at this time of the year. Three options are available to you: (1) make your hotel booking as part of an integrated travel package to London - this often results in substantial discounts on normal hotel and air fare costs; (2) make a hotel booking through the Imperial College Conference Office which offers a range of hotels near to the College; (3) make a direct booking with a hotel. A number of hotels are offering a discounted rate for delegates at the conference, a list of which is available on request from the Secretariat.

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INDOOR AND AMBIENT AIR QUALITY CONFERENCE - 13-15th June 1988

Mon 13th June	Tues 14th June	Wed 15th June
Registration Venue: 13th June 10:00-11:00 am	Two Parallel Sessions Session 2: Lecture Theatre 220: Environmental Tobacco Smoke & Passive Smoking Session 3: Lecture Theatre 334: Indoor Air Quality and Respiratory Ventilation and Discomfort - Sick Building Syndrome Indoors by Session 4: Lecture Theatre 334: Airborne Bacteria & Fungus	Two Parallel Sessions Session 7: Lecture Theatre 220: Risk Assessment & Health Session 8: Lecture Theatre 334: Architectural Design Criteria
	LUNCH	LUNCH
Session 1 11:30-12:30 pm Lecture Theatre 220	Two Parallel Sessions Session 5: Lecture Theatre 220: Risk Assessment & Health Session 6: Lecture Theatre 334: Control of Indoor Air Quality	Two Parallel Sessions Session 9: Lecture Theatre 220: Air Quality Monitoring Session 10: Lecture Theatre 334: Indoor Air Chemistry
Evening Chairman's Wine & Cheese Reception 19:30-20:30	Conference Dinner, Sherfield Building 19:30-20:30 Guest Speaker Sir A. J. Harris	

Social Programme

The social programme outlined below is open to all delegates and guests. The cost of the social programme is fully inclusive in the registration fee.

Monday 13th June at 18:00-20:00

Chairman's Wine and Cheese Reception

This informal reception, hosted by the Conference Chairman, Professor Perry, will provide an opportunity for all delegates and guests to meet in a relaxed social atmosphere.

Tuesday 14th June at 19:30

Conference Dinner

The conference dinner will be held in the Sherfield Building at Imperial College when the guest speaker will be Professor Sir Alan J. Harris.

Accompanying Persons

The fee charged for accompanying persons not attending the technical sessions of the conference will cover lunches, refreshments and participation in the conference social programme above.

Conference Proceedings

The conference proceedings will be published in advance and made available to delegates at the conference. The proceedings volume will be in the form of a hard bound book suitable for library distribution with appropriate ISBN reference. The cost of the proceedings is included in the conference registration fee.

Monday 13th June pm

PLENARY SESSION Lecture Theatre 220.

- 13:30 Professor R. Perry, Imperial College, UK
Chairman's Opening Remarks
- 13:35 Comparative evaluation of indoor and ambient air quality - legislation
- M. J. Suess, WHO Regional Office for Europe, Denmark
- 14:00 Comparative evaluation of indoor and ambient air quality - chemical considerations
- R. M. Harrison, I. Colbeck and A. Simmons, University of Essex, UK
- 14:25 Comparative criteria for indoor and ambient air quality - biological considerations
- N. J. B. Bell, Imperial College, London, UK
- 14:50 Ventilation, health and energy conservation: A workable compromise
- G. J. Robertson, Acva Atlantic Inc., Fairfax, USA
- 15:15 Tea Interval
- 15:30 Evaluating the significance of asbestos in air: lessons for assessment of other pollutants
- B. T. Commins, Maidenhead, UK
- 15:55 The Health Consequences of Environmental Tobacco Smoke
- B. S. Hulka, University of North Carolina at Chapel Hill, USA
- 16:20 The analysis of the contribution of ETS to indoor air
- C. J. Proctor, BAT (UK and Export) Ltd, Southampton, UK
- 16:45 Typical pollutant concentrations in public buildings
- E. M. Sterling and C. W. Collett, Vancouver, Canada
- 17:30 Close of Session

Tuesday 14th June am

Session 2

Environmental Tobacco Smoke and Passive Smoking Lecture Theatre 220

Chairman - Dr D. J. Eatough, Brigham Young University, USA

- 8:45 The physical behaviour of sidestream tobacco smoke under ambient conditions
- J. N. Pritchard, A. Black and J. J. McAughey, Harwell Laboratory, UK
- 9:05 Prediction of the build-up and decay of ETS components by mathematical modelling
- D. P. Robinson and N. D. Warren, BAT (UK and Export) Ltd, Southampton, UK
- 9:25 Collection and analysis of Solanesol as a tracer of environmental tobacco smoke (ETS)
- M. W. Ogden and K. C. Mainio, R. J. Reynolds Tobacco Co., USA
- 9:45 ETS concentrations under different conditions of ventilation and smoking regulation
- T. Sterling, Vancouver, Canada
- 10:05 A facility for the sensory evaluation of environmental tobacco smoke
- C. B. Kurtz and M. R. Savoca, R. J. Reynolds Tobacco Company, USA
- 10:25 The build-up and decay of environmental tobacco smoke constituents as a function of room conditions
- R. R. Baker, P. D. Case and N. D. Warren, BAT (UK and Export) Ltd, Southampton, UK
- 10:45 Coffee Interval

Chairman - Dr M. Fugas, Institute for Medical Research and Occupational Health, Yugoslavia

- 11:00 Assessing exposure to environmental tobacco smoke
- D. J. Eatough, Brigham Young University, USA
- 11:20 Assessment of ETS impact on office air quality
- J. Jacques-Piade, P. M. Europe, Switzerland
- 11:40 Suspected pulmonary carcinogens in environmental tobacco smoke
- D. M. Aviardo, Atmospheric Health Sciences, Short Hills, USA
- 12:00 Tobacco smoke and passive smoking
- S. Shanmuganandan, Madurai Kamaraj University, India
- 12:15 Environmental tobacco smoke in the work place
- P. W. W. Kirk, S. O. Bakk, M. Hunter, J. N. Lester and R. Perry, Imperial College, London, UK
- 12:30 Lunch Interval

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Tuesday 14th June am

Session 3

Indoor Air Quality with respect to Ventilation and Dispersion — Sick Building Syndrome Lecture Theatre 334

Chairman — Dr J S M Boleij, National Institute of Public Health and Environmental Hygiene, The Netherlands

- 8 45 The relationship between passive cigarette smoke exposure in office workers and symptoms of Building Sickness
— A S Robertson, P Sherwood Burge, A Hedge, S Wilson and J Harris Bass, University of Birmingham, East Birmingham Hospital, Building Use Studies, London, Robert Mathew, Johnson-Marshall, London, UK, Cornell University, USA
- 9 05 A global approach to investigate indoor air quality and performance of a ventilation system
— V H Nguyen, N Goyer, J Lavoie, Institut de recherche en sante et en securite du travail du Quebec, Canada
- 9 25 Calculated and measured indoor radon concentrations in the house with mechanical exhaust ventilation
— H Kokoti, P Kallikosi and T Raunemaa, University of Kuopio, Finland
- 9 45 Comparison of formaldehyde and radon levels in different ventilation systems
— T Reponen, H M Kokoti, T Savolainen and R Raunemaa, University of Kuopio, Finland
- 10 05 Perceived quality of indoor and ambient air
— P O Fanger, Technical University of Denmark, Lyngby, Denmark
- 10 25 Air quality and symptoms in a sick library ventilated with or without return
— B Berglund, L Lundin, C Morath, I Johansson and T Lindvall, University of Stockholm, Sweden, National Institute of Environmental Medicine and Karolinska Institute, Sweden
- 10 45 Coffee Interval

Tuesday 14th June am

Session 4

Airborne Bacteria/Fungi Lecture Theatre 334

Chairman — Dr J N Lester, Imperial College, UK

- 11 00 Fungal Allergens dispersed by air-conditioning filters
— J H Eklmann, W Jorde, M Schata and H F Linskens, Monchengladbach, FRG
- 11 15 Relationship between home dampness, airborne mould propagules and guanine levels in housedust
— P Fischer, A Verhoef, B Brunekreef, J S M Boleij, J van Wijnen and E van Reenen, Agricultural University Wageningen, Municipal Health Service, Amsterdam, Centraal Bureau voor Schimmelcultures, Baarn, The Netherlands
- 11 30 Enumeration of airborne micro-organisms in work environments
— B Crook and J Lacey, Rothamsted Experimental Station, UK
- 11 45 VOCs and lung
— D S Wallinshaw, Environmental Health Centre, Ottawa, Canada
- 12 00 Enumeration and identification of airborne viable mould propagules in houses: A field comparison of selected techniques
— A P Verhoef, J H Van Wijnen, P Atwood, J S M Boleij, B Brunekreef, E S Van Reenen and R A Samson, Municipal Health Service Agricultural University, Centraal Bureau voor Schimmelcultures, The Netherlands
- 12 15 Factors affecting airborne moulds in domestic buildings
— B Flannigan et al, Heriot Watt University, UK
- 12 30 Lunch Interval

Tuesday 14th June pm

Session 5

Risk Assessment and Health (1) Lecture Theatre 220

Chairperson — Dr B S Hulka, The University of North Carolina at Chapel Hill, USA

- 14 00 An alternative explanation for the increased risk of lung cancer in non-smokers married to smokers
— P N Lee, Sutton, UK
- 14 20 Application of physiological pharmacokinetic modeling to the design of human exposure studies with environmental tobacco smoke
— N J Butler, S L Schwartz and D J Eatough, Georgetown University Medical Center, Brigham Young University, USA
- 14 40 Quantitative and qualitative differences in tobacco smoke uptake between active and passive smoking
— G Scherer, K Westphal, M Sorsa and F Aulicler, Forschungsgesellschaft Rauchen und Gesundheit mbH, FRG, Institute of Occupational Health, Finland
- 15 00 Age as a modifying factor in the association between lung cancer in non-smoking women and their husbands' smoking status
— S J Kilpatrick, Medical College of Virginia, USA
- 15 20 Tea Interval

Chairman — S J Kilpatrick, Medical College of Virginia, USA

- 15 40 Health effects of passive smoking in the workplace
— W A Crawford, Seaford, NSW, Australia
- 16 00 An international survey of the health effects of involuntary tobacco smoke exposure
— M J Fisher, Stone Mountain, Georgia, USA
- 16 20 Cotinine concentrations in urine during early childhood with smoking parents at home
— J St Jordanov, P Miteva and S Romanova, Research Institute of Pediatrics, Sofia, Bulgaria
- 16 40 Environmental tobacco smoke inhalation and lung function
— M Kentner, Institute für Arbeits- und Sozial-Medizin, Erlangen, FRG
- 17 00 Passive smoking in intarcted patients: role of indoor exposure
— A Leone, City Hospital, Castelnuovo, Italy
- 17 15 Passive smoking, young people and parents
— C Arcuti, Genova, Italy
- 17 30 Lung function and bronchial reactivity of parents and children
— J Kuehr, Freiburg, FRG
- 17 45 ETS — Lung cancer epidemiology: supportability of misclassification and risk assumptions
— S L Schwartz and N J Butler, Georgetown University Medical Center, USA
- 18 00 Close of Session

Tuesday 14th June pm

Session 6

General Indoor and Ambient Air Quality Lecture Theatre 334

Chairman — Dr R M Harrison, University of Essex, UK

- 14 00 Modelling the dispersion of airborne pollutants in the indoor environment
— T B Hansen, N O Breum, J S Markvorsen and J Hansen, COWI consult, Danish National Institute of Occupation Health, Denmark
- 14 20 Air Pollution by selected organics and photooxidants in the lower Athens atmosphere
— E Tsani-Bazaca, Athens, Greece
- 14 40 Nitrogen dioxide at the building facade in relation to distance from road traffic
— D P H Laxen, R A Jensen and K Brooks, London Scientific Services, UK
- 15 00 Spreading of combustion products from side wall balanced flue terminals
— W H V van Heugten, Duth VEG-Gasinstituut, The Netherlands
- 15 20 Tea Interval

Chairman — D P H Laxen, London Scientific Services, UK

- 15 40 A study on biomass fuels: source of indoor air pollution
— A Mandal, Rajendra Prasad, M K Sarkar and B K Sarkar, Indian Institute of Technology, New Delhi, India
- 16 00 Biomass fuel combustion and indoor air quality in developing countries
— J S M Boleij, Wageningen Agricultural University, The Netherlands
- 16 20 Indoor air pollution due to emission from wood burning stoves — an overview
— A Mandal and A K Mandal, Delhi, India
- 16 40 Canadian Indoor Air Quality Standards, Guidelines and Research Activities: an Overview
— D S Wallinshaw, Environmental Health Centre, Ottawa, Canada
- 17 00 Design, evaluation and implications of a study intervening in the Tobacco Habits of Rural Indian Population
— M B Agri, Tata Institute of Fundamental Research, Bombay, India
- 17 30 Close of Session

Ariado: (Art. 100, 101)

17 suspected carcin. in ETS (NTP, IARC, RTECS)

posit. lung carcin. reference subst.: 3,3'-dichloromethyl ether (industrial chemical)
 hu epid.: sufficient
 Oat cell carcin.
 tumors in animal inhal.

B(o)p:

insuff. evidence for exp. to compound only

S. 144: yel. grn. Table 8

Lee:

1.3 mean rel. risk of women never smokers married to smokers
 as determined from 17 studies currently available.

\therefore 15% of dose of active smokers would be required to produce
 this effect, if ETS is the origin and the dose is linearly related
 to carcinogenicity

- but in fact only 0.02% of the dose of an active smoker has been
 estimated by biomonitoring (rel. risk 1.01!)

\therefore epidemiologic and dosimetric estimates are highly discrepant!
 (factor 100!)

Bretz:

use of an indiv. chemical to estimate ETS dose
 assumes either

the chemical measured is the constituent responsible for
 the health effect

or

behaves similar to it.

blood level \rightarrow dose \rightarrow exposure \rightarrow ETS effects

Salaper:

ETS deposition: 11%

Wednesday 15th June am

Session 7

Risk Assessment and Health (2) Lecture Theatre 220

Chairman — Dr Schwartz, Georgetown University Medical Center, USA

- 8 45 Never smoke lung cancer deaths from exposure to ETS
— A Arundel, T Sierling and J Wenham, Simon Fraser University, Canada
- 9 05 Exposure of hamsters and rats to sidestream smoke of cigarettes: preliminary results of a 90 day inhalation study
— Dr F Adlkofer, G Scherer, R Wenzel, Hartung, H Brune and C Thomas, Forschungsgesellschaft Rauchen und Gesundheit mbH, FRG, Biologisches Laboratorium, FRG, Pathologisches Institut, FRG
- 9 25 Simultaneous nicotine and cotinine levels in plasma and urine as an index of environmental tobacco smoke uptake
— S Imai, E Higashi and Y Shimizu, Kyoto Senba Hospital, Sakama Medical University, Japan
- 9 45 Impact of a smoking policy in Canadian Government workplace
— L Oumet, Health Promotion Directorate, Ottawa, Canada
- 10 05 Environmental Tobacco Smoke and Passive Smoking
— C E Rossiter, London School of Hygiene and Tropical Medicine, UK
- 10 25 Combination effects in the registration of chronic toxic and especially of carcinogenic effects
— D Schmahl, German Cancer Research Centre, Heidelberg, FRG
- 10 45 Coffee Interval
- Chairman — F Adlkofer, Forschungsgesellschaft Rauchen und Gesundheit mbH, FRG
- 11 00 The behaviour of aerosols within dwellings in assessing the consequences of releases of radioactivity to the environment
— R J Cannell, M MacCurtain, H M AspSimon and A J H Goddard, Imperial College, London, UK
- 11 20 Health effects of indoor nitrogen dioxide pollution
— L J Oikstra, D Mouthuys, I Alkerman, B Brunekreef, University of Wageningen, The Netherlands
- 11 40 Indoor air quality — a relevant factor in human exposure
— M Fugas, Institute for Medical Research and Occupational Health, Zagreb, Yugoslavia
- 12 00 Inhalation challenge studies of tobacco smoke sensitive asthmatics
— R P Stankus and S B Lehrer, Tulane University Medical Center, USA
- 12 15 Passive smoking and lung cancer: reanalyses of Miyama's data
— K Ubera and W Ahlborn, Ludwig-Maximilians-Universität, FRG
- 12 30 Lunch Interval

Wednesday 15th June am

Session 8

Architectural and Design Criteria Lecture Theatre 334

Chairman — Dr P. Warren, Building Research Establishment, Watford, UK

- 8 45 Architectural and design considerations with respect to indoor air quality
— P Burberry, UMIST, UK
- 9 05 Control of Legionnaires Disease
— P O Sullivan, UWIST, UK
- 9 25 Environmental quality in energy efficient office buildings — architectural design considerations
— B Palmquist and E M Sterling, Hulbert Group B C Ltd, Vancouver, Canada
- 9 45 Oxides of nitrogen concentrations in residences
— K Segal, Institute for Medical Research and Occupational Health, Zagreb, Yugoslavia
- 10 05 Adverse indoor climate — a question about imperfect management of technology
— E Rodahl, Norwegian Institute of Technology, Norway
- 10 25 Indoor air composition in office rooms with central air supply
— E Rohbock, H Müller and T Zingsheim, Battelle-Institut, Frankfurt, FRG
- 10 45 Coffee Interval
Chairman — Professor E Rodahl, The Norwegian Institute of Technology
- 11 00 Thermal comfort of operating team and thermal balance of anaesthetized patients in operating theatres with and without airconditioning
— H Ohlke, U Dormans, A Schaettler and J Beckert, Institut für Lübeck, FRG
- 11 20 Climate in hospitals
— L Polmann, Institut für Arbeitsund Sozial Medizin, Giessen, FRG
- 11 40 Quality control of the indoor thermal state of heated dwellings
— D Petras, SVF SVST, Bratislava, Czechoslovakia
- 12 00 Salient factors influencing the level of volatile organic compounds indoor
— P Wolkoff, National Institute of Occupational Health, Denmark

Wednesday 15th June pm

Session 9

Analytical Methodology Lecture Theatre 220

Chairperson — Dr E. Tsani-Bazaca, Athens, Greece

- 14 00 Design of Indoor Quality Study
— D M Kollander, USEPA, Washington, USA
- 14 20 Identification of noxious agents in indoor air
— S Waldner-Sander, DEKRA Institute für Sicherheit, Stuttgart, FRG
- 14 40 Evaluation of a new Formaldehyde passive diffusion monitor at high and low relative humidity
— M Koocher, H Q Luong and J A Tremblay, Crystal Diagnostics Inc, USA
- 15 00 Odourants diffusion of a foundry by field and wind tunnel experiments
— W J Kost and E Plate, DEKRA-Institute für Sicherheit, FRG, Universität Karlsruhe, FRG
- 15 20 Tea Interval
- Chairman — M.W. Ogden, R.J. Reynolds Tobacco Co., USA
- 15 40 A general purpose scheme for classifying lead-bearing particles by SEM-EDX
— A Hunt, J Wall, D Johnson and I Thornton, Imperial College, UK, College of Environmental Science & Forestry, Syracuse, USA
- 16 00 Development and application of a thermal desorption-based analytical method for the determination of nicotine in indoor environments
— R A Jenkins, C V Thompson and C E Higgins, Oak Ridge National Laboratory, Tennessee, USA
- 16 20 Development of a microcomputer program for predicting residential nitrogen dioxide concentrations
— C P Wray and G K Yuill, C K Yuill & Associates Ltd, Winnipeg, Canada
- 16 40 An automated system for the analysis of organic airborne vapours
— G M Broadway, Perkin Elmer Ltd, Beaconsfield, UK
- 17 00 Determination of mercury levels in the atmosphere of workplace and the biological samples of dental practitioners
— M B Korkovelou, P A Siskos, A X Apostolopoulos, T A Athanassioulis, University of Athens, Greece
- 17 20 Determination of environmental nicotine by automatic two-stage thermal desorption gas chromatography
— R E Bell, R G Haslett and R G Rawbone, Gallaher Ltd, Belfast
- 17 40 Close of Session

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Wednesday 15th June pm

Session 10

Indoor Air Chemistry Lecture Theatre 334

Chairman — Dr M. J. Suess, WHO, Denmark

- 14.00 Environmental Asbestos
— A. P. Rood, Health and Safety Executive, London, UK
- 14.20 Pathways and behaviour of semi-volatile chemicals in enclosed spaces
— I. L. Gebelueg and F. Korte, Institut fuer Oekologische Chemie, FRG
- 14.40 Levels of toxic heavy metals (Hg, Cd, As) in biofluids and tissues of staff in academic chemical laboratories and correlation to the environment quality
— M. Kuppans, A. Calokennos, A. Koutsodimou and P. A. Siskos, University of Athens, Greece
- 15.00 Odour reduction by biological soil filters
— B. Berglund, U. Berglund and L. Lundin, University of Stockholm, Sweden
- 15.20 Tea Interval

Chairman — B. T. Commins, Maidenhead, UK

- 15.40 State-of-the-Art Indoor Air Quality Technology
— H. E. Burroughs, ASHRAE Atlanta, USA
- 16.00 A study of indoor radon levels in dwellings
— G. Jonsson, University of Lund, Sweden
- 16.40 Sources and concentrations of formaldehyde in household dusts
— V. M. Brown, D. R. Crump and D. Gardiner, Department of the Environment, UK
- 17.00 Close of Session

CHANGES TO PROGRAMME AS AT 6 JUNE 1988

Tuesday 14th June am — Session 2 — Lecture Theatre 220:

(Shanmuganandan paper withdrawn)

12.00 Kirk et al. paper

Tuesday 14th June am — Session 4 — Lecture Theatre 334

(Walkinshaw VOCs paper withdrawn)

11.50 Verhoeff et al. paper

12.10 Flannigan et al. paper

Tuesday 14th June pm — Session 5 — Lecture Theatre 220

(Kuehr paper withdrawn)

17.20 Arciti paper

17.40 Schwartz & Balter paper

Tuesday 14th June pm — Session 6 — now in Lecture Theatre 334

(Hansen et al. paper withdrawn)

14.00 Tsani-Bazaca paper

14.25 Laxen et al. paper

14.50 van Heugten paper

(Aghi paper withdrawn)

17.00 Close of Session

Wednesday 15th June am — Session 7 — Lecture Theatre 220

(Rossiter paper withdrawn)

10.05 Meta-Analyses on Passive Smoking & Lung Cancer.
M. Letzel, E. Blümler & K. Überle, IGB, München, FRG

Wednesday 15th June am — Session 8 — Lecture Theatre 334

(Petrás paper withdrawn)

11.40 Wolkoff paper

12.00 Close of Session

Wednesday 15th June pm — Session 9 — Lecture Theatre 220

(Kollander paper withdrawn)

14.00 R.E. Bell et al. paper (from 17.20)

(Maldner-Sander paper withdrawn)

14.20 A Practical Control System for Indoor Pollution.
P. Fleming, Moriba Instruments Ltd., UK

17.30 Close of Session

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Prithard:

- local deposition in various parts of the resp. tract is an important determinant of the systemic dose and the bio. effects
- differential removal speed in the trachea and lungs

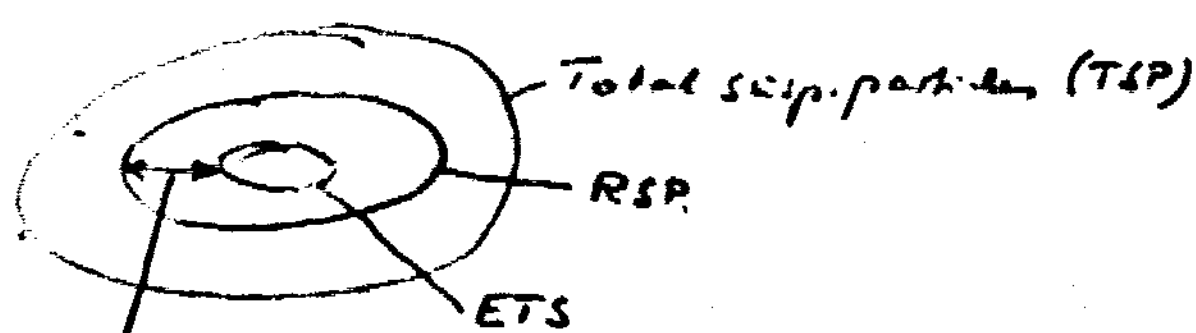
Ogden:

RSP: 2 groups

- 1 related to EIS, lab studies ← Ogden's group
- 1 ETS, field studies

Potential tracers of ETS: nicotine - due to its nature not representative for any of the SS component (not in GVP, PP, redistribution phenomena)

RSP
UV-PH
CO
NO_x
arom. hydrocarbons



UV-PH (uvosillar, which compound is measured): fluoropore filtration
columnar HPLC
detection at 323 nm

Solanosol:

- similar conc. of solanosol and nicotine in tobacco leaf (up to 4%) weight of leaf
- in PP of ETS aerosol
- no equil. shift during sampling
- negligible to TS in an indoor environment

Sampling at 1-2 l/min

1-2 h sampling

derivatization (pyridine + BSTFA)

GC-FID

easily decomposes at high temp. ! major analytical problem, occurs also during smoking

DL: 200 pg

0.3 pg/m³

Solanosol/RSP ratio recommended as indicator of ETS contribution to indoor air atmosphere

free flavor eq.: 3.0

1024F : 4.0

Cross-contamin:

potato
eggplant
mushrooms
tomatoes
pepper

DURATION OF EXPOSURE AS A DETERMINANT OF LUNG CANCER RISK
IN PASSIVE SMOKERS

T. HIRAYAMA

Institute of Preventive Oncology,
HI BLDG., 1-2 Ichigaya-Sadoharacho,
Shinjuku-ku, Tokyo 162

ABSTRACT

Age at first exposure to passive smoking (or age at first marriage to smoking husbands) in non-smoking women in Japan was observed to be about 8 years earlier than the age at first exposure to active smoking (or age at start of smoking) and was identified as an important risk factor which determines the extent of lung cancer risk elevation in non-smoking women with smoking husbands in addition to the amount of husbands smoking.

INTRODUCTION

Non-smoking wives with smoking husbands were observed to carry higher risk of lung cancer. The risk tended to go up with the increase in daily number of cigarettes smoked by the husbands (1, 2).

For lung cancer risk in active smokers the duration of exposure is considered as a key risk determinant which is even more important than daily amount of smoking (3). This might also be true for lung cancer risk in passive smokers. To examine the validity of the issue, the age at first exposure to passive smoking was studied for non-smoking wives with smoking husbands and compared with the age at start of smoking in active smokers in women in a large scale cohort study in Japan.

RESULTS

In case of non-smoking women, the exposure to passive smoking must start from the age at first marriage to smoking husbands. For lung cancer cases in non-smoking wives with smoking husbands the mean age at first marriage to smoking husbands was calculated as 22.47, while for lung cancer cases in smoking women the mean age at start of smoking was observed to be 30.40 (Table 1). This means the age at first exposure to passive smoking is 8 years earlier than the age at first exposure to active smoking. This must be an additional reason for the elevated lung cancer risk in non-smoking women with smoking husbands in Japan which should be considered when one compares extent of lung cancer risk elevation between passive and active smokers (Fig. 1).

In a large scale cohort study in Japan a nested case-control study conducted between 200 cases of lung cancer and 851 cases of controls (stomach cancer) revealed the earlier the age at first marriage the more striking the effect of husband smoking. In case of non-smoking women age under 59 married to smoking husbands the lung cancer risk adjusted to wives age and amount of husbands smoking was 4.95 (1.47-16.69) (case 18, control 61), 1.76 (1.10-2.80) (case 66, control 245), 1.41 (0.76-2.62) (case 31, control 117) when married at

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age 19 or earlier, at age 20-23 and at age 24 or older respectively, compared to the non-smoking women married to non-smoking husbands, corresponding frequency being 1, 10, 6 for cases and 18, 62, 31 for controls.

DISCUSSION

Many factors or conditions should be considered in comparing the lung cancer risk in passive smokers with the lung cancer risk in active smokers. Besides differences in chemical structure, in particular, the concentration of various carcinogens in side-stream smoke and main stream smoke, different route of inhalation (nose vs mouth), differences in the size of smoke particles resulting in the difference in places of deposition etc., the 8 years longer mean duration of exposure to tobacco smoke in passive smokers than in active smokers observed in the present paper must be kept in mind in interpreting the risk difference in both type of smokers.

In addition to the amount of exposure to passive smoking, the duration of exposure must be the principal lung cancer risk determinants in passive smokers, just as in case of active smokers, as shown in the present appear by the higher lung cancer risk in women married at earlier age with smoking husbands.

This observation also strongly indicates the importance of the measurement of lung cancer risk due to the exposure to passive smoking from the childhood.

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1. Doll, R., Peto, R.J. (1978) *J. of Epid. and Comm. Health.*, 32(4), 303-312.
2. Hirayama, T. (1981) *Brit. med. J.*, 282, 183-185..
3. Hirayama, T. (1984) *Lung Cancer, Causes and Prevention.*, Ed. M. Mizell and P. Correa. pp.175-195.

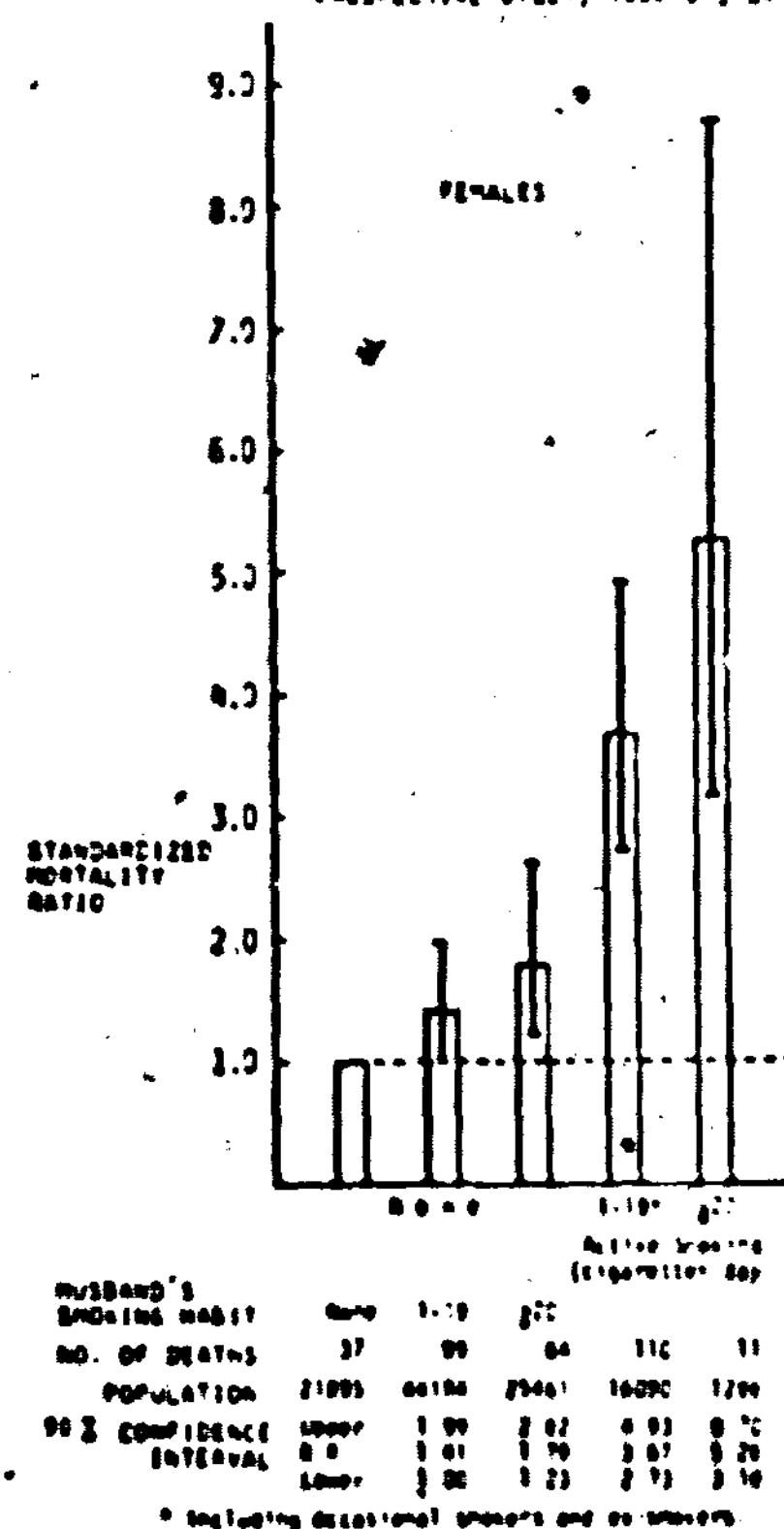
Table 1

Age at First Exposure of Non-smoking Women to Spouse Smoking is Much Younger than Age Began Smoking in Smoking Women

Women's Age	Age at first exposure of non-smoking women to passive smoking		Age at first exposure of smoking women to active smoking	
	number	%	number	%
Total	154	100.0	87	100.0
- 19	25	16.8	1	1.1
20 - 24	98	63.6	30	34.5
25 - 29	26	16.9	11	12.6
30 - 34	1	0.6	20	23.0
35 -	0	-	25	28.7
Mean Age	22.47		30.40	

Fig. 1

ACTIVE AND PASSIVE SMOKING AND LUNG CANCER MORTALITY
RELATIVE RISK (RR) WITH 90 PERCENT
CONFIDENCE INTERVAL
PROSPECTIVE STUDY, 1961-81, JAPAN

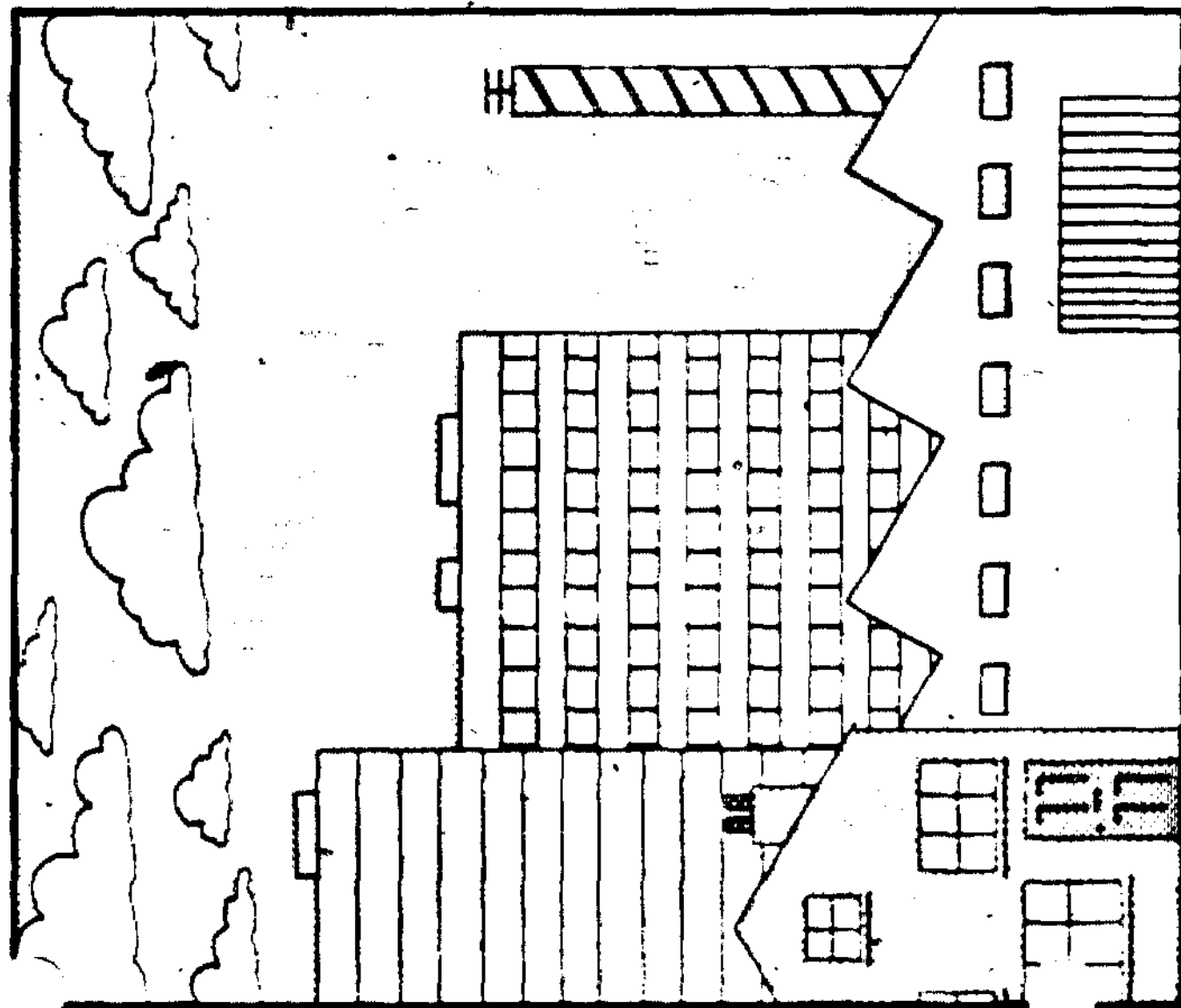


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International Conference

**INDOOR AND AMBIENT
AIR QUALITY**
13-15 June 1988



Imperial College
London

Programme and Invitation
to Register

**SECRETARIAT
INTERNATIONAL INDOOR AND
AMBIENT AIR QUALITY CONFERENCE**
c/o Professor R. Perry
Public Health & Water Resource Engineering
Department of Civil Engineering
Imperial College
London SW7 2BU
United Kingdom

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INDOOR AND AMBIENT AIR QUALITY CONFERENCE 13-15 June 1988
REGISTRATION FORM/REQUEST FOR FURTHER INFORMATION

REGISTRATION DETAILS

Please complete as soon as possible
Please use BLOCK CAPITALS

Author	(inclusive of attendance at technical presentations, hardbound copy of Proceedings, lunches, refreshments and social programme) £200	Name	<input type="checkbox"/> I wish to register as above <input type="checkbox"/> I enclose registration fee for £
Delegates	(inclusive of attendance, hardbound copy of Proceedings, lunches, refreshments and social programme) £220	Title (Prof, Dr, Mr, Ms)	Name of accompanying person (where appropriate)
Student Delegates	(by prior arrangement with Professor Perry and only if application is accompanied by letter of approval from your supervisor) £100	Address	<input type="checkbox"/> Registration fee of £
Accompanying Persons	(covering lunches, refreshments and social programme as described above) £60	Telephone No.	will be paid on arrival at the Registration Desk
		Telex No.	Cheques and bankers drafts should be made payable to AIR QUALITY CONFERENCE and sent to the Conference Secretariat
		Signature	
		Date	

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18 DEC 90

Wednesday 15th June pm

Session 10

Indoor Air Chemistry Lecture Theatre 334

Chairman — Dr M. J. Suess, WHO, Denmark

- 14.00 Environmental Asbestos
— A. P. Rood, Health and Safety Executive, London, UK
- 14.20 Pathways and behaviour of semi-volatile chemicals in enclosed spaces
— I. L. Gebeluegi and F. Korte, Institut fuer Oekologische Chemie, FRG
- 14.40 Levels of toxic heavy metals (Hg, Cd, As) in biofluids and tissues of staff in academic chemical laboratories and correlation to the environment quality
— M. Koupparis, A. Calokerinos, A. Koutsodimou and P. A. Siskos, University of Athens, Greece
- 15.00 Odour reduction by biological soil filters
— B. Berglund, U. Berglund and L. Lundin, University of Stockholm, Sweden
- 15.20 Tea Interval

Chairman — B. T. Commins, Maidenhead, UK

- 15.40 State-of-the-Art Indoor Air Quality Technology
— H. E. Burroughs, ASHRAE Atlanta, USA
- 16.00 A study of indoor radon levels in dwellings
— G. Jonsson, University of Lund, Sweden
- 16.40 Sources and concentrations of formaldehyde in household dusts
— V. M. Brown, D. R. Crump and D. Gardiner, Department of the Environment, UK
- 17.00 Close of Session

FOREWORD

With problems of indoor air quality becoming increasingly apparent, it is essential to have a far more detailed and fundamental understanding of the occurrence of specific chemicals in indoor air, and of their mechanisms of interaction and modes of dispersion. Such factors are heavily influenced both by construction materials used in buildings and their design as well as building ventilation and maintenance.

The contribution made to air quality by passive smoking and environmental tobacco smoke is typically an area that needs careful scientific evaluation, as do such problems as 'sick building syndrome' which has recently attracted considerable publicity. Here the importance of architectural and service design is widely acknowledged with many innovative changes needed for the future.

Accordingly the conference will centre on the scientific, engineering and health aspects of indoor air quality, whilst concentrating upon the following major themes:

- Indoor Air Chemistry
- Specific Chemicals, their Interaction and Dispersion
- Environmental Tobacco Smoke and Passive Smoking
- Airborne Bacteria
- Risk Assessment and Health Effects
- Indoor Air Quality Control
- Ventilation and Dispersion
- Architectural Design Concepts
- Transport Related Air Pollution
- Air Quality Impact Assessment
- Ambient Air Quality Monitoring

Both state-of-the-art reviews and original research papers will be presented as will specific case studies and field evaluations.

The conference has already attracted submitted papers from universities, research laboratories, regulatory agencies and administrators, as well as from private industry in many countries. The outcome will prove invaluable both to the experienced worker in the field wishing to discuss the most up-to-date research, as well as providing an excellent overview for an administrator or industrial scientist whose brief includes ambient air quality.

The Chairman and Technical Programme Committee are pleased to extend an invitation to you to participate in this major international conference and look forward to a very successful meeting in June.

R. Perry

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GENERAL INFORMATION

Venue

The Conference will be held at Imperial College, University of London, which is situated at South Kensington in central London. The London underground at South Kensington is within comfortable walking distance and provides direct easy access from Heathrow Airport and via British Rail from Gatwick Airport. A large number of hotels are within easy walking distance of the College.

Technical Programme

The Conference will commence at 13.30 on Monday 13th June. An initial session of plenary lectures will be followed by two parallel sessions throughout the conference. Details of invited and contributed papers are given in the following programme.

Registration

Delegates should, as far as possible, make their registration in advance. A registration form is enclosed and this should be completed and returned to the Secretariat as soon as possible.

Registration will take place in the Department of Mechanical Engineering at Imperial College, situated on Exhibition Road on Monday 13th June, from 10.30 until 18.00 and commencing at 8.15 on each successive day. All delegates will be able to collect conference literature and proceedings from the registration desk prior to the Conference. At the registration desk you should present your confirmation of registration, or, if you have not paid prior to the conference, you will be required to settle the amount in full, either in travellers cheques, personal cheques or cash.

Official Language

The official language of the Conference is English which will be used for all presentations and printed material.

Authors' Briefing Sessions

Authors should meet their session chairman in the lecture theatre where their paper is to be presented, 10 minutes before the commencement of the session. This period is for briefing by the session chairman and to organize arrangements for any slides, overheads to be used. 35 mm and overhead projectors will be available in both lecture theatres.

Lunches and Refreshments

A buffet lunch will be served on the 14th and 15th June, in addition to coffee and tea which will be served mid-morning and mid-afternoon. A Chairman's Wine and Cheese Reception will be held between 18.00 and 20.00 on Monday 13th June and the Conference Dinner will be held in the Sutherland Building, Imperial College, on the evening of 14th June. All lunches, refreshments and social events are included in the registration fee.

Accommodation and Travel

Although no specific hotel has been defined for the conference, early hotel and travel bookings are advised at this time of the year. Three options are available to you: (1) make your hotel booking as part of an integrated travel package to London - this often results in substantial discounts on normal hotel and air fare costs; (2) make a hotel booking through the Imperial College Conference Office which offers a range of hotels near to the College; (3) make a direct booking with a hotel. A number of hotels are offering a discounted rate for delegates at the conference, a list of which is available on request from the Secretariat.

Wednesday 15th June pm

Session 9

Analytical Methodology Lecture Theatre 220

Chairperson — Dr E. Tsani-Bazaca, Athens, Greece

- 14.00 Design of Indoor Quality Study
— D. M. Kollander, USEPA, Washington, USA
- 14.20 Identification of noxious agents in indoor air
— S. Waldner-Sander, DEKRA Institute für Sicherheit, Stuttgart, FRG
- 14.40 Evaluation of a new Formaldehyde passive diffusion monitor at high and low relative humidity
— M. Koocher, H. Q. Luong and J. A. Tremblay, Crystal Diagnostics Inc., USA
- 15.00 Odourants diffusion of a foundry by field and wind tunnel experiments
— W. J. Kost and E. Plate, DEKRA-Institute für Sicherheit, FRG, Universität Karlsruhe, FRG
- 15.20 Tea Interval

Chairman — M. W. Ogden, R. J. Reynolds Tobacco Co., USA

- 15.40 A general purpose scheme for classifying lead-bearing particles by SEM ECX
— A. Hunt, J. Watt, D. Johnson and I. Thornton, Imperial College, UK, College of Environmental Science & Forestry, Syracuse, USA
- 16.00 Development and application of a thermal desorption-based analytical method for the determination of nicotine in indoor environments
— R. A. Jenkins, C. V. Thompson and C. E. Higgins, Oak Ridge National Laboratory, Tennessee, USA
- 16.20 Development of a microcomputer program for predicting residential nitrogen dioxide concentrations
— C. P. Wray and G. K. Yuill, C. K. Yuill & Associates Ltd, Winnipeg, Canada
- 16.40 An automated system for the analysis of organic airborne vapours
— G. M. Broadway, Perkin Elmer Ltd, Beaconsfield, UK
- 17.00 Determination of mercury levels in the atmosphere of workplace and the biological samples of dental practitioners
— M. B. Korkovelou, P. A. Siskos, A. X. Apostolopoulos, T. A. Athanassoulis, University of Athens, Greece
- 17.20 Determination of environmental nicotine by automatic two-stage thermal desorption gas chromatography
— R. E. Bell, R. G. Haslett and R. G. Rawbone, Gallaher Ltd, Belfast
- 17.40 Close of Session

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Wednesday 15th June am

Session 8

Architectural and Design Criteria Lecture Theatre 334

Chairman — Dr P. Warren, Building Research Establishment, Watford, UK

- 8.45 Architectural and design considerations with respect to indoor air quality
— P. Burberry, UMIST, UK
- 9.05 Control of Legionnaires Disease
— P. O'Sullivan, UWIST, UK
- 9.25 Environmental quality in energy efficient office buildings — architectural design considerations
— B. Palmquist and E. M. Sterling, Hulbert Group B.C. Ltd, Vancouver, Canada
- 9.45 Oxides of nitrogen concentrations in residences
— K. Segal, Institute for Medical Research and Occupational Health, Zagreb, Yugoslavia
- 10.05 Adverse indoor climate — a question about imperfect management or technology
— E. Rørdahl, Norwegian Institute of Technology, Norway
- 10.25 Indoor air composition in office rooms with central air supply
— E. Rohbock, H. Müller and T. Zingsheim, Battelle-Institut, Frankfurt, FRG
- 10.45 Coffee Interval
Chairman — Professor E. Rørdahl, The Norwegian Institute of Technology
- 11.00 Thermal comfort of operating team and thermal balance of anaesthetized patients in operating theatres with and without airconditioning
— H. Ohgke, U. Dormans, A. Schaeffler and J. Beckert, Institut für Lübeck FRG
- 11.20 Climate in hospitals
— L. Pollmann, Institut für Arbeitsund Sozial Medizin, Giessen, FRG
- 11.40 Quality control of the indoor thermal state of heated dwellings
— D. Petráš, SVF SVST, Bratislava, Czechoslovakia
- 12.00 Salient factors influencing the level of volatile organic compounds indoor
— P. Wolkoff, National Institute of Occupational Health, Denmark

Social Programme

The social programme outlined below is open to all delegates and guests. The cost of the social programme is fully inclusive in the registration fee.

Monday 13th June at 18.00-20.00
Chairman's Wine and Cheese Reception.

This informal reception, hosted by the Conference Chairman, Professor Perry, will provide an opportunity for all delegates and guests to meet in a relaxed, social atmosphere.

Tuesday 14th June at 19.30

Conference Dinner

The conference dinner will be held in the Sherfield Building at Imperial College when the guest speaker will be Professor Sir Alan J. Harris.

Accompanying Persons

The fee charged for accompanying persons not attending the technical sessions of the conference will cover lunches, refreshments and participation in the conference social programme above.

Conference Proceedings

The conference proceedings will be published in advance and made available to delegates at the conference. The proceedings volume will be in the form of a hard bound book suitable for library distribution with appropriate ISBN reference. The cost of the proceedings is included in the conference registration fee.

INDOOR AND AMBIENT AIR QUALITY CONFERENCE — 13-15th June 1988

	Mon 13th June	Tues 14th June	Wed 15th June
Morning	Registration / Mechanical Eng/Dept, Imperial College from 10.30 am	Two Parallel Sessions Session 2 (Lecture Theatre 220) Environmental Tobacco Smoke & Passive Smoking Session 3 (Lecture Theatre 334) Indoor Air Quality with Respect to Ventilation and Dispersion — Sick Building Syndrome followed by Session 4 (Lecture Theatre 334) Airborne Bacteria Fung	Two Parallel Sessions Session 7 (Lecture Theatre 220) Risk Assessment & Health (2) Session 8 (Lecture Theatre 334) Architectural Design Criteria
Afternoon	Session 1 13.30 Plenary Session Lecture Theatre 220	LUNCH Two Parallel Sessions Session 5 (Lecture Theatre 220) Risk Assessment & Health (1) Session 6 (Lecture Theatre 334) General Indoor & Ambient Air Quality	LUNCH Two Parallel Sessions Session 9 (Lecture Theatre 220) Analytical Methodology Session 10 (Lecture Theatre 334) Indoor Air Chemistry
Evening	Chairman's Wine & Cheese Reception 18.00-20.00	Conference Dinner (Sherfield Building) 19.30 Guest Speaker Sir A. J. Harris	

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Monday 13th June pm

PLENARY SESSION Lecture Theatre 220.

- 13.30 Professor R. Perry, Imperial College, UK
Chairman's Opening Remarks
- 13.35 Comparative evaluation of indoor and ambient air quality —
legislation
— M. J. Suess, WHO Regional Office for Europe, Denmark
- 14.00 Comparative evaluation of indoor and ambient air quality —
chemical considerations
— R.M. Harrison, I. Colbeck and A. Simmons, University of
Essex, UK
- 14.25 Comparative criteria for indoor and ambient air quality —
biological considerations
— N.J.B. Bell, Imperial College, London, UK
- 14.50 Ventilation, health and energy conservation. A workable
compromise
— G.J. Robertson, Acva Atlantic Inc., Fairfax, USA
- 15.15 Tea Interval
- 15.30 Evaluating the significance of asbestos in air: lessons for
assessment of other pollutants
— B.T. Commins, Maidenhead, UK
- 15.55 The Health Consequences of Environmental Tobacco Smoke
— B.S. Hulka, University of North Carolina at Chapel Hill, USA
- 16.20 The analysis of the contribution of ETS to indoor air
— C.J. Proctor, BAT (UK and Export) Ltd, Southampton, UK
- 16.45 Typical pollutant concentrations in public buildings
— E.M. Sterling and C.W. Collett, Vancouver, Canada
- 17.30 Close of Session

Wednesday 15th June am

Session 7

Risk Assessment and Health (2) Lecture Theatre 220

Chairman — Dr Schwartz, Georgetown University Medical Center, USA

- 8.45 Never smoke lung cancer deaths from exposure to ETS
— A. Arundel, T. Sterling and J. Weinkam, Simon Fraser
University, Canada
- 9.05 Exposure of hamsters and rats to sidestream smoke of
cigarettes: preliminary results of a 90-day inhalation study
— Dr F. Adikofer, G. Scherer, R. Wenzel-Hartung, H. Brune and
C. Thomas, Forschungsgesellschaft Rauchen und Gesundheit
mbH, FRG, Biologisches Laboratorium, FRG, Pathologisches
Institut, FRG
- 9.25 Simultaneous nicotine and cotinine levels in plasma and urine as
an index of environmental tobacco smoke uptake
— S. Itani, E. Higashi and Y. Shimizu, Kyoto Senbai Hospital,
Saitama Medical University, Japan
- 9.45 Impact of a smoking policy in Canadian Government workplace
— L. Ouimet, Health Promotion Directorate, Ottawa, Canada
- 10.05 Environmental Tobacco Smoke and Passive Smoking
— C. E. Rossiter, London School of Hygiene and Tropical
Medicine, UK
- 10.25 Combination effects in the registration of chronic toxic and
especially of carcinogenic effects
— D. Schmähl, German Cancer Research Centre, Heidelberg,
FRG
- 10.45 Coffee Interval

**Chairman — F. Adikofer, Forschungsgesellschaft Rauchen und
Gesundheit mbH, FRG**

- 11.00 The behaviour of aerosols within dwellings in assessing the
consequences of releases of radioactivity to the environment
— R. J. Cannell, M. MacCurtain, H. M. AspSimon and A. J. H.
Goddard,
Imperial College, London, UK
- 11.20 Health effects of indoor nitrogen dioxide pollution
— L. J. Dijkstra, D. Houthuijs, I. Akkerman, B. Brunekreef,
University of Wageningen, The Netherlands
- 11.40 Indoor air quality — a relevant factor in human exposure
— M. Fugas, Institute for Medical Research and Occupational
Health, Zagreb, Yugoslavia
- 12.00 Inhalation challenge studies of tobacco smoke sensitive
asthmatics
— R. P. Stankus and S. B. Lehrer, Tulane University Medical
Center, USA
- 12.15 Passive smoking and lung cancer: reanalyses of Hirayama's
data
— K. Überall and W. Ahlborn, Ludwig-Maximilians-Universität,
FRG
- 12.30 Lunch Interval

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Tuesday 14th June pm

Session 6

General Indoor and Ambient Air Quality Lecture Theatre 220

Chairman — Dr R.M. Harrison, University of Essex, UK

- 14.00 Modelling the dispersion of airborne pollutants in the indoor environment
— T.B. Hansen, N.O. Breum, J.S. Markvorsen and J. Hansen
COWI consult, Danish National Institute of Occupation Health, Denmark
- 14.20 Air Pollution by selected organics and photooxidants in the lower Athens atmosphere
— E. Tsani-Bazaca, Athens, Greece
- 14.40 Nitrogen dioxide at the building facade in relation to distance from road traffic
— D.P.H. Laxen, R.A. Jensen and K. Brooks, London Scientific Services, UK
- 15.00 Spreading of combustion products from side wall balanced flue terminals
— W.H.V. van Heugten, Duth VEG-Gasinstituut, The Netherlands
- 15.20 Tea Interval

Chairman — D.P.H. Laxen, London Scientific Services, UK

- 15.40 A study on biomass fuels source of indoor air pollution
— A. Mandal, Rajendra Prasad, M.K. Sarkar and B.K. Sarkar,
Indian Institute of Technology, New Delhi, India
- 16.00 Biomass fuel combustion and indoor air quality in developing countries
— J.S.M. Boleij, Wageningen Agricultural University, The Netherlands
- 16.20 Indoor air pollution due to emission from wood burning stoves—
an overview
— A. Mandal and A.K. Mandal, Delhi, India
- 16.40 Canadian Indoor Air Quality Standards, Guidelines and Research Activities: an Overview
— D.S. Walkinshaw, Environmental Health Centre, Ottawa, Canada
- 17.00 Design, evaluation and implications of a study 'Intervening in the Tobacco Habits of Rural Indian Population'
— M.B. Aghi, Tata Institute of Fundamental Research, Bombay, India
- 17.30 Close of Session

Tuesday 14th June am

Session 2

Environmental Tobacco Smoke and Passive Smoking
Lecture Theatre 220

Chairman — Dr D.J. Eatough, Brigham Young University, USA

- 8.45 The physical behaviour of sidestream tobacco smoke under ambient conditions
— J.N. Pritchard, A. Black and J.J. McAughey, Harwell Laboratory, UK
- 9.05 Prediction of the build-up and decay of ETS components by mathematical modelling
— D.P. Robinson and N.D. Warren, BAT (UK and Export) Ltd, Southampton, UK
- 9.25 Collection and analysis of Solanesol as a tracer of environmental tobacco smoke (ETS)
— M.W. Ogden and K.C. Maiolo, R.J. Reynolds Tobacco Co., USA
- 9.45 ETS concentrations under different conditions of ventilation and smoking regulation
— T. Sterling, Vancouver, Canada
- 10.05 A facility for the sensory evaluation of environmental tobacco smoke
— C.B. Kurtz and M.R. Savoca, R.J. Reynolds Tobacco Company, USA
- 10.25 The build-up and decay of environmental tobacco smoke constituents as a function of room conditions
— R.R. Baker, P.D. Case and N.D. Warren, BAT (UK and Export) Ltd, Southampton, UK
- 10.45 Coffee Interval

Chairman — Dr M. Fugas, Institute for Medical Research and Occupational Health, Yugoslavia

- 11.00 Assessing exposure to environmental tobacco smoke
— D.J. Eatough, Brigham Young University, USA
- 11 Assessment of ETS impact on office air quality
— J. Jacques Prade, P.M. Europe, Switzerland
- 11.40 Suspected pulmonary carcinogens in environmental tobacco smoke
— D.M. Aviado, Atmospheric Health Sciences, Short Hills, USA
- 12.00 Tobacco smoke and passive smoking
— S. Shanmuganandan, Madurai Kamaraj University, India.
- 12.15 Environmental tobacco smoke in the work place
— P.W.W. Kirk, S.O. Baek, M. Hunter, J.N. Lester and R. Perry, Imperial College, London, UK
- 12.30 Lunch Interval

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Tuesday 14th June am

Session 3

Indoor Air Quality with respect to Ventilation and Dispersion — Sick Building Syndrome Lecture Theatre 334

Chairman — Dr J.S.M. Boleij, National Institute of Public Health and Environmental Hygiene, The Netherlands

- 8.45 The relationship between passive cigarette smoke exposure in office workers and symptoms of "Building Sickness"
— A.S. Robertson, P. Sherwood Burge, A. Hedge, S. Wilson and J. Harris Bass, University of Birmingham, East Birmingham Hospital, Building Use Studies, London, Robert Matthew, Johnson-Marshall, London, UK, Cornell University, USA
- 9.05 A global approach to investigate indoor air quality and performance of a ventilation system
— V.H. Nguyen, N. Goyer, J. Lavoie, Institut de recherche en santé et en sécurité du travail du Québec, Canada
- 9.25 Calculated and measured indoor radon concentrations in the house with mechanical exhaust ventilation
— H. Kokotti, P. Kallioikoski and T. Raunemaa, University of Kuopio, Finland
- 9.45 Comparison of formaldehyde and radon levels in different ventilation systems
— T. Reponen, H.M. Kokotti, T. Savolainen and R. Raunemaa, University of Kuopio, Finland
- 10.05 Perceived quality of indoor and ambient air
— P.O. Fanger, Technical University of Denmark, Lyngby, Denmark
- 10.25 Air quality and symptoms in a sick library ventilated with or without return
— B. Berglund, L. Lundin, C. Morath, I. Johansson and T. Lindvall University of Stockholm, Sweden, National Institute of Environmental Medicine and Karolinska Institute, Sweden
- 10.45 Coffee interval

Tuesday 14th June am

Session 4

Airborne Bacteria/Fungi Lecture Theatre 334

Chairman — Dr J.N. Lester, Imperial College, UK

- 11.00 Fungal Allergens dispersed by air-conditioning filters
— J.H. Eixmann, W. Jorde, M. Schata and H.F. Linskens, Monchengladbach, FRG
- 11.15 Relationship between home dampness, airborne mould propagules and guanine levels in housedust
— P. Fischer, A. Verhoeff, B. Brunekreef, J.S.M. Boleij, J. van Wijnen and E. van Reenen, Agricultural University Wageningen, Municipal Health Service, Amsterdam, Centraal Bureau voor Schimmecultures, Baarn, The Netherlands
- 11.30 Enumeration of airborne micro-organisms in work environments
— B. Crook and J. Lacey, Rothamsted Experimental Station, UK
- 11.45 VOCs and fungi
— D.S. Walkinshaw, Environmental Health Centre, Ottawa, Canada
- 12.00 Enumeration and identification of airborne viable mould propagules in houses. A field comparison of selected techniques
— A.P. Verhoeff, J.H. Van Wijnen, P. Attwood, J.S.M. Boleij, B. Brunekreef, E.S. Van Reenen and R.A. Samson, Municipal Health Service Agricultural University, Centraal Bureau voor Schimmecultures, The Netherlands
- 12.15 Factors affecting airborne moulds in domestic buildings
— B. Flannigan et al., Heriot Watt University, UK
- 12.30 Lunch interval

Tuesday 14th June pm

Session 5

Risk Assessment and Health (1) Lecture Theatre 220

Chairperson — Dr B.S. Hulka, The University of North Carolina at Chapel Hill, USA

- 14.00 An alternative explanation for the increased risk of lung cancer in non-smokers married to smokers
— P.N. Lee, Sutton, UK
- 14.20 Application of physiological pharmacokinetic modeling to the design of human exposure studies with environmental tobacco smoke
— N.J. Bailor, S.L. Schwartz and D.J. Eatough, Georgetown University Medical Center, Brigham Young University, USA
- 14.40 Quantitative and qualitative differences in tobacco smoke uptake between active and passive smoking
— G. Scherer, K. Wesiphal, M. Sorsa and F. Adlkofer, Forschungsgesellschaft Rauchen und Gesundheit mbH, FRG, Institute of Occupational Health, Finland
- 15.00 Age as a modifying factor in the association between lung cancer in non-smoking women and their husbands' smoking status
— S.J. Kilpatrick, Medical College of Virginia, USA
- 15.20 Tea interval

Chairman — S.J. Kilpatrick, Medical College of Virginia, USA

- 15.40 Health effects of passive smoking in the workplace
— W.A. Crawford, Sealorth, NSW, Australia
- 16.00 An international survey of the health effects of involuntary tobacco smoke exposure
— M.J. Fisher, Stone Mountain, Georgia, USA
- 16.20 Cotinine concentrations in urine during early childhood with smoking parents at home
— J. St Jordanov, P. Mileva and S. Romanova, Research Institute of Pediatrics, Sofia, Bulgaria
- 16.40 Environmental tobacco smoke inhalation and lung function
— M. Kentner, Institute für Arbeits- und Sozial-Medizin, Erlangen, FRG
- 17.00 Passive smoking in infarcted patients: role of indoor exposure
— A. Leone, City Hospital, Castelnuovo, Italy
- 17.15 Passive smoking, young people and parents
— C. Arcuti, Genova, Italy
- 17.30 Lung function and bronchial reactivity of parents and children
— J. Kuehr, Freiburg, FRG
- 17.45 ETS — Lung cancer epidemiology: supportability of misclassification and risk assumptions
— S.L. Schwartz and N.J. Bolter, Georgetown University Medical Center, USA
- 18.00 Close of Session